Brookhaven National Laboratory National Synchrotron Light Source		Number: LS-ESH-0004	Revision: 03
		Effective: 05/03/2004	Page 1 of 7
Subject: NSLS Operations Group Chemical Spill Response			
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*Document must contain approved signatures for validity.

1.0 PURPOSE

This procedure is to provide guidance to the NSLS Operations Staff for response to chemical spills at the National Synchrotron Light Source.

2.0 SCOPE

The Operations Coordinators are the first contact for all issues relating to the NSLS Experimental Program. Many experiments require some wet chemistry and Users bring a wide variety of chemicals to the Light Source as part of their study. Spills are inevitable and operations will be contacted for assistance. Since quantities of hazardous materials are generally small, most spills will not generate an emergency condition and should be readily cleaned up by the responsible party, supported as needed by NSLS Operations and ESH Staff.

The Op Co's have an important support role in response to spills, but are **not emergency response personnel**. They are needed to make initial judgments regarding the potential consequences of a spill and to initiate protective actions for personnel, the building, and the environment consistent with this procedure.

THE BNL EMERGENCY SERVICES PERSONNEL WILL HANDLE ANY SPILL THAT IS JUDGED TO PRESENT AN EMERGENCY SITUATION.

3.0 RESPONSIBILITY

3.1 Users/Scientific Staff: NSLS Users and Scientific Staff are responsible for reporting, controlling, and cleaning small chemical spills that result from their work at the facility. He/She shall:

1. Immediately report any chemical spill to the NSLS Control Room.
2. Act to contain the spilled material.
3. Remain available to report information about the spilled material.
4. Clean up and package the spilled material for disposal.
5. Call BNL Emergency Services (ext. 2222) and the NSLS Control Room (2550) if the spill presents an emergency (see Chemical Spill Guidelines below).

3.2 NSLS ES&H Staff: The NSLS ES&H Staff is responsible for providing guidance on cleaning and containing chemical spills and for assisting with incident response.

3.3 NSLS Operations Coordinators: The NSLS Operations Coordinators will help

evaluate chemical spills that take place on the NSLS Experimental Floors. He/She shall:

1. Report to the spill site to evaluate the spill
2. Summon BNL Emergency Services if an emergency is judged to exist.
3. Ensure that the scene is controlled to prevent harm to individuals by restricting access to the spill location, including, if necessary, evacuating the entire building
4. If safe, take initial actions to control the spread of the spill to drains.
5. Assist with spill response (Outlined below).
6. Contact the NSLS ES&H Staff for assistance.
7. Maintain communications with the NSLS Control Room.

3.4 NSLS Machine Operator: The NSLS Machine Operator is responsible for coordinating communications between the Op Co at the spill scene and the remainder of personnel at the facility. He/She shall:

1. Collect information from the Op Co at the scene.
2. Make appropriate announcements over the NSLS Public Address system.
3. Initiate a building evacuation as necessary.

4.0 SPILL RESPONSE

In responding to a spill, the first priority of the Operations Coordinator is to reduce or eliminate the potential for harm to individuals resulting from the spill. The Operations Coordinator shall take no action that places him/herself or other personnel on the experimental floors in danger. A second priority shall be to contain the spill to prevent release to the environment if containment can be accomplished without risk of personnel injury.

Upon arrival to the scene, the Opco shall:

4.1 Collect the following information:

1. Identification of the material released.
2. An approximation of the quantity released.
3. A brief description of the incident and actions taken.

4.2 Evaluate: Evaluate conditions and determine if the situation presents significant risk to personnel, equipment, or the environment and should be considered an emergency. See guidance below. Contact a member of the NSLS ES&H Staff for assistance if time permits.

4.3

Control:

4.3.1 EMERGENCIES. Emergencies require assistance from the BNL Emergency Services group. BNL Emergency Services can be reached on extension 2222 or 911. Upon determination that an emergency exists, the Op Co will take the following action:

1. Move personnel away from the scene. Conditions will determine how much clearance is needed. A complete building evacuation could be necessary.
2. Call BNL Emergency Services and the NSLS Control Room.
3. Be prepared to provide the information collected above (Sec 4.1) and to report the precise location of the incident.

4.3.2 NON-EMERGENCIES. The owner of the spilled material will take the following action to contain and clean spills judged not to present an emergency. The Op Co reporting to the scene will assist, but **the primary responsibility for clean up and disposal of the spill rests with the owner of the spilled material.**

1. Move personnel away as necessary.
2. Maintain contact with the Control Room. Direct the NSLS Machine Operator in making appropriate building announcements to keep personnel informed as necessary.
3. Don neoprene gloves and goggles (available in room 1-150). Overalls and boots are also available if needed, however, it is expected that small, non-emergency spills will only require gloves and eye protection.
4. Apply an appropriate adsorbent to the spill (See Chemical Spill Guidelines below). **Where possible, prevent the spilled liquid from entering any drains.**

NOTE: Any chemical release to a drain is an environmental concern and must be reported to BNL Emergency Services (ext. 2222). Drains in building 725 are directed to the BNL sanitary water system and ultimately to the Peconic River. Releases to the drain may be reportable to the US EPA and must be reported so that determination can be made.

Any petroleum product spill within the building greater than 5 gallons must be reported to BNL Emergency Services. Spills exterior to the building are to be handled in the same manner as those within the building. Protect the drains if possible and attempt to contain the material to asphalt or concrete surfaces. Any spill to the grass must be reported to BNL Emergency Services to determine if notification to external regulators is required.

5. Collect the wet adsorbent and seal it in the plastic containers located in room 1-150.
6. Label the container and complete the paperwork necessary for disposal through the BNL Waste Management Facility.

6. TRAINING

6.1 NSLS Users/Scientific Staff: NSLS Users and Scientific Staff that use hazardous materials have sufficient knowledge and experience to handle small spills that do not present an emergency.

6.2 NSLS Operations Staff & Technicians: NSLS Operations Staff and Technicians must review this procedure with their supervisors and a member of the NSLS ES&H Staff.

Chemical Spill Guidelines

Guidelines for response to chemical spills follow:

Scope

All sorts of materials come to the NSLS for study. Most materials arrive in small quantities; typically just a few milliliters of solution or grams of solid. The following materials are likely to be used in larger quantities and are stored in chemical storage cabinets around the experimental floor:

Solvents: Alcohols, Hexane, Acetone, Toluene.
Acids: Hydroflouric acid, Hydrochloric acid, Sulfuric acid, Acetic acid, Nitric Acid.
Other: Pump oil, Hydrogen Peroxide

Significant spills are most likely to include one of the liquids listed above.

Resources

NSLS maintains a supply of adsorbents and gloves in spill stations distributed on the experimental floor and in room 1-150. A map is attached below.

The Spill Stations contain:

- Universal adsorbent pillows and pads (white) (may be used for any liquid spill)
- Alkaline neutralizer (may be used with all alkaline solutions)
- Acid neutralizer (may be used with all acids including Hydroflouric acid)
- Mercury adsorbent
- Gloves; Silver Shield and Nitrile
- Goggles
- Tyvek coveralls
- Waste bags
- Calcium Gluconate Gel (for HF burns)

Room 1-150 contains:

- Universal adsorbent pads (**black**) (may be used for any liquid spill)
- Oil adsorbent pads (**white**) (for oils only, including PCB oils)
- Alkaline neutralizer (may be used with all alkaline solutions)
- Acid neutralizer (may be used with all acids including Hydroflouric acid)
- Mercury adsorbent
- Granular adsorbent (crushed corn cob) (may be used for most spills; not for use with hydroflouric acid, concentrated nitric acid, or concentrated hydrogen peroxide)
- Gloves, Tyvek coveralls, bags, goggles

Response

Appropriate spill response requires some knowledge of what has spilled, where it has spilled, and how much has spilled. With that information, a judgement as to how to proceed can be made. The Op Co responding to the site must evaluate the conditions and determine what help is needed. Any member of the NSLS E&H Staff can assist with that evaluation. General guidelines follow:

- Significant risk of fire or personnel hazard is an emergency that requires notification and request for assistance to the BNL Emergency Services Group at extension 2222.

- The chemical user can often handle small volume (<500 ml) spills of the liquids listed above. All cleaning materials should be collected for disposal through the BNL Hazardous Waste Management Facility.

- Many solvents and all alcohols are flammable. Acetone has a very low flash point and ignites more easily than the other solvents. An unconfined spill of flammable liquid exceeding one liter is an emergency situation and requires removal of personnel from the immediate area and a call to extension 2222.

- Acid solutions are corrosive, reactive, and often release irritating vapors. An unconfined acid solution spill exceeding one liter is an emergency situation and requires removal of personnel from the immediate area and a call to extension 2222. Any spill of hydroflouric acid requires assistance from the BNL Emergency Services personnel.

- Concentrated (>50%) hydrogen peroxide is extremely reactive and could ignite fuel materials. Hydrogen peroxide solutions at a concentration greater than 10% are irritating to the skin and eyes. Any spill of concentrated hydrogen peroxide (>50%) requires assistance from the BNL Emergency Services personnel.

- Benzene and chloroform are occasionally in use at the NSLS. These are liquid carcinogens that evaporate fast and so present significant risk of inhalation. Benzene is flammable. Spills of these two liquids exceeding 50 ml require assistance from the BNL Emergency Services personnel.

- Pump oil is not considered a hazardous material and is non-flammable. It is messy and slippery. Pump oil clean up materials should be collected for disposal through the BNL Hazardous Waste Management Facility. It is treated as, “Industrial Waste”.

Map of the Spill Stations

Spillmap.pdf

NSLS REVISION & PERIODIC REVIEW LOG

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> See NSLS Quality Control Coordinator for original revision and review signatures <

REVISION TABLE

Rev	Description	Date
02	Added text pertaining to oil spill response	12/19/03
03	Added text in the ESH staff responsibility and chemical spill resources sections. Removed Bob Casey from approval. Added Randolph Church to approval.	05/03/04

PERIODIC REVIEW TABLE

Complete this table to record the completion of periodic reviews for an existing controlled document. A successful periodic review will reveal the existing document is current, correct, and does not require any revision/change.

Document Review Frequency
3 years

Rev	Date	Reviewed By (Print):	Signature:
02	12/19/03	Andrew Ackerman	